ICI MAGAZINE

PRICE TWOPENCE APRIL 1956

THE I.C.I. MAGAZINE

VOLUME 34 NUMBER 234 APRIL 1956

The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1. Phone: VICtoria 4444. The editor is glad to consider articles for publication, and payment will be made for those accepted.

CONTENTS

FRONT COVER: *Basket weavers' yard in the holy city of Moulay Idriss (French Morocco), by D. E. St. A. Harney (Billingham Division)*

OUR CONTRIBUTORS

MALDWYN JONES *has been Technical Service and Development Manager at Plastics Division since* 1946. *He is the man principally behind the technical side of I.C.I.'s £4m. butadiene project now taking shape at Wilton.*

J. B. D. PAGDEN *works in the Export Department of Plant Protection Ltd., where he is head of the Europe and Near East Section. In recent years he has visited every country in Europe (except those behind the Iron Curtain) and much of the Near East.*

G. T. PERKINS *works in the Pensions and Assistance Funds Department at Head Office. He joined the Company as a messenger boy in* 1936 *and two years later became an accounts clerk. He is a member of the Cartophilic Society of Great Britain.*

JOHN WATNEY *is a recent recruit to Central Publicity Department and author of the best-seller* The Enemy Within.

Benefits of Butadiene

By Maldwyn Jones (Plastics Division)

The word butadiene may today mean li ttle or nothing to the man in the street. But before long new products based on t his gas will be making themselves felt in the home—as shoe soles which look and behave like leather but last three or four times as long; as a better emulsion pain t, quick drying and washable; and as a special synthetic rubber for gaskets, wa shers, petrol hose and flexible fuel tanks.

DURING recent years butadiene has become one of the most important raw materials in the world. Its production now approaches the one million tons a year mark—a distinction enjoyed by few organic chemicals.

You may well ask: To what do we owe this spectacular development of a new chemical and how is it used?

In the first place, butadiene is one of the basic raw materials for synthetic rubber manufacture. Synthetic rubber came to the fore during the last war, when the United States of America poured vast sums into its manufacture because of the scarcity of natural rubber when Japan occupied Malaya. Today the United States, Germany and Russia are all big producers and consumers of butadiene for this purpose.

But there is another side to the picture. Butadiene —a gas which boils at minus 4·5° centigrade—is a by-product of the oil-refining industry, so that with the establishment of oil refineries in Britain since the war substantial quantities of butadiene have, for the first time, become available.

So far as I.C.I. is concerned, butadiene is available to us in the C4 gas stream from the Wilton oil cracker. It has therefore been decided to make full use of this butadiene, not by turning it into a general-purpose synthetic rubber, but by combining it with certain other chemicals to make a special range of what are known as 'Butakon' copolymers.*

A plant is now being erected for this purpose at Wilton by Plastics Division. It is expected to be completed before the end of the year, when it will be capable of making about 10,000 tons per annum of butadiene copolymers. The scheme therefore represents one of the biggest chemical projects under development within I.C.I. at the present time, and the capital exceeds £4,000,000. It involves the collaboration of three Divisions: Billingham Division who will supply the butadiene; General Chemicals Division who will supply acrylonitrile and methyl methacrylate; and Plastics Division who will be responsible for the manufacture, development and sales of the polymers produced.

All this may sound a project rather remote from the interests of the ordinary person. Yet in fact the products which will come from the new Wilton factory this autumn will have a very definite impact on our way of life, and may even help to cheapen a little the cost of living.

These may seem big claims, yet they are in fact no exaggeration. The biggest group of products to come from the new factory will be rubber-like substances which will combine the flexibility of natural rubber with resistance to swelling and weakening by oils. They are in fact oil-resisting synthetic rubbers. There is here a large industrial demand—for the manufacture of petrol and oil hose, for various gaskets and washers such as those used in aircraft hydraulic equipment, and finally for flexible tanks now so popular for storing fuel in both civil and military aircraft and made extensively by Marston Excelsior in Metals Division. These developments are due entirely to the inability of natural rubber or of any other elastic material to resist the swelling action of oils in a satisfactory manner.

But there is another use for butadiene copolymers which comes much closer home. Certain copolymers of butadiene have the power to stiffen or reinforce ordinary rubber compositions, and by their use rubber manufacturers are now able to reach a goal which has long evaded them. They are able to mix rubber with these butadiene reinforcing resins in such a way that the resulting compositions not only look and behave like leather but have a longer wearing life.

Systematic Trials

Already in the United States about 40% of all shoe soles are made with the aid of these butadiene copolymers. During the past three years Plastics Division has been conducting systematic wearing trials on such compositions, and some most interesting conclusions have been reached. In the first place we have been astonished at the "sole-destroying" propensities of the modern teenager. It is refreshing to report that by 1957 shoe manufacturers should be in a position to make soles with the aid of I.C.I. 'Butakon' resins which will outlast leather by three or four times.

The impact of butadiene copolymers will also be felt in the home in other ways too—in improved emulsion paints and improved paper for the glossy magazines. Emulsion paints can be made from several materials, but those based on a butadiene copolymer emulsion are undoubtedly the best. This emulsion produces a quick-drying, washable paint which can be applied without difficulty by the most impractical type of people. In America, where emulsion paints are probably more extensively used than in Great Britain, over 90% are based on such butadiene-styrene emulsions.

Versatile Plastic

It may seem a far cry from paints to glossy paper. No one can accuse these butadiene copolymers of not being versatile! Hitherto high-quality gloss papers have been produced by the application of a coating composition consisting largely of clay with a casein or starch binder. It has now been proved that if the casein is replaced in whole or in part by certain butadiene copolymer emulsions, improved results are

*Polymers are made by inducing the molecules of a single substance to join together to form large molecules with properties quite different from those from which they are derived. For example, gaseous ethylene is polymerised to form polythene. Copolymers are made by polymerising a mixture of two or more substances.

'Butakon' synthetic rubber being sheeted from a laboratory mill

obtained. The appearance is better, high-speed printing is more effective, and the paper is more resistant to moisture, to changes in dimension, and to curling. Maybe before long your *Magazine* will owe a new super-shiny gloss to the Wilton factory of Plastics Division.

These are the chief immediate outlets for butadiene copolymers from Wilton. But progress in the chemistry of polymerisation and world developments in synthetic rubber and plastics suggest that these steps mark merely the beginning of a major new industry in Britain.

British Research Work

Indeed, it is only right that we in Britain should pursue with vigour the development of butadiene copolymers, since so much of the early research work in this field of organic chemistry was carried out here. It is associated very closely with the efforts that chemists have been making over the past sixty years to produce "test tube rubber."

British chemists have often been in the forefront of this search, which reached a peak about 1910 when such famous names as Sir William Tilden, Sir William Ramsey and Professor W. H. Perkin, Jr., were all associated with the project. Unfortunately success did not reward their effort; but during the 1914–18 war the Germans achieved a limited success with a synthetic rubber based on a close relative of butadiene. There are, in fact, interesting reports on record of the failure of mechanised road vehicles on their journey into Austria because of the breakdown of the synthetic rubber tyres.

Germany takes the Lead

The next steps were concerned with the development of the techniques of emulsion polymerisation and of copolymerisation during the late 1920s and the early 1930s. The lead at this time was being taken by Germany, but the loss to the Allies of the rubber-producing areas of the Far East stimulated the United States of America to what was perhaps the biggest industrial development of all time. By 1944 their production of synthetic rubber based mainly on butadiene reached 764,000 tons, a figure which was quickly exceeded but which is well below present-day production. The American effort was possible because of the vast amount of butadiene which could be made available from oil refineries and from natural gas sources, although for a time considerable quantities were also made from grain alcohol.

Dyestuffs Division Pioneer

During this time a limited amount of work was being carried out in the Dyestuffs Division on the production of synthetic rubber from butadiene. For a variety of reasons, mainly associated with the supply of essential raw materials, full-scale manufacture was never established. At one stage, however, copolymers of butadiene and methyl methacrylate were showing such promise that an actual motor tyre was made. In addition, Blackley chemists made very important contributions to the technique of copolymerisation which has later been adopted throughout the world for the manufacture of "cold" rubber, i.e. rubber polymerised at unusually low temperatures.

In many ways the history of butadiene polymers in Britain is similar to that of the dyestuffs industry, where the first synthetic organic dyestuff—mauveine—was discovered by Sir William Perkin in 1860, yet the growing industry was allowed to gravitate towards Germany and to grow up there until the exigencies of the first world war brought it back.

Another Butadiene Project

In like manner much of the earlier fundamental work on butadiene polymers and on synthetic rubber was carried out in this country with W. H. Perkin, a son of the discoverer of the first synthetic dyestuff, playing an important part; but all substantial production was established elsewhere, and only now after another world war is it returning.

This story has finally been capped by the announcement that a plant capable of manufacturing 40,000 tons per year of synthetic rubber based on butadiene is shortly to be established by one of the leading tyre manufacturing companies in Britain. This is a project somewhat different in character from the I.C.I. scheme here described but is further proof, if proof were needed, that butadiene will become one of the main chemicals of this country as it has already become in several others.

One man and his Job—40

THE POTTER

WHEN they first started to talk to me about throwing, I felt inclined to duck. But I was reassured when I saw Rupert Capewell quietly at work. The piece of wet clay which he was handling with practised ease in the works of Steatite and Porcelain Products Ltd. weighed around 140 lb. And in any case Rupert was far too engrossed in his strenuous task to notice the casual visitor who stood admiring his craftsmanship.

I was on a brief tour of the Steatite and Porcelain Works at Stourport in Worcestershire, where about a thousand people are employed in making insulators of all types, from the smallest—those found in radio and television sets—to the largest—those which must withstand voltages as high as 400,000 volts in electric power stations.

Of course I asked the question: "Well, what is steatite?" My ignorance was treated with benevolence. I was told that steatite is a naturally occurring mineral which looks rather like white clay. Because it has a soapy feel it is sometimes known as soapstone. Many people will know it in another form as talc, the homely powder used to dust babies and, in a refined and perfumed form, to adorn the faces of older babies.

Back to Rupert Capewell, whose job must be one of the oldest traditional crafts surviving in industry today. The throwing process of which Rupert is a master is limited to large shapes which present unusual difficulties.

Throwing is, in fact, one of the earliest-known methods of fashioning hollowware pottery. How old it is we do not really know. The potter's wheel was certainly well established by Christian times, and it seems probable that as far back as 3000 B.C. the Sumerians, Babylonians and Assyrians in the valleys of the Tigris and Euphrates threw clay on a kick-wheel much as we know it today.

The earliest potters are thought to have employed a rough board which they turned with one hand while shaping the clay with the other. This was a forerunner to the slow-running circular wheel or tournette, which in turn gave way to the heavier kick-wheel and finally to the modern industrial wheel, powered by an electric motor.

It is the wheel powered by an electric motor which Rupert Capewell uses day after day in producing the clay chocks which are later turned on a lathe and ultimately become bushings for incorporation in high-voltage electrical apparatus. What does "throwing" consist of? After centring the piece on the throwing wheel, Rupert Capewell sets the wheel in motion and proceeds to work with his hands on the surface of the clay.

At first the mass is completely inert and resists the efforts made to change its shape, but under steady pressure Rupert reduces its diameter and increases its length until it is shaped rather like a tall stalagmite. He then carefully bends the top off-centre and applying downward pressure slowly reduces the piece to a squat conical shape. When this operation has been repeated several times, Rupert can feel that the piece is ready to take its final shape—when, in fact, it will flow under his hands without developing internal strains likely to appear as cracks when the clay dries.

The risk of creating strains in a plastic body is one of the peculiarities of clay working and one which the potter must try to avoid at all times. For this reason, when forming an insulator with a large bore the thrower will use as many as five or six wooden boring tools, starting with quite a small one to avoid sudden change of contour.

Throughout this operation Capewell is assisted by George Furness, whose job it is to lift the clay to and from the wheel and help in a great many other ways during the strenuous task of shaping and moulding the clay in readiness for the next operation. When the piece is completely thrown, it is cut from the wheel by a length of thin wire and placed on a rack to "condition" for the turning process. The work which Capewell and Furness do becomes, after further processes in the factory, the foundation for the huge electrical insulators which play their part in supplying electricity to homes throughout the country.

The period of apprenticeship for throwing is five years. As Rupert Capewell will tell you, there is never a time when you really cease to learn. J.T.T.

Rupert Capewell

Information Notes

TECHNICAL CHANGES IN I.C.I.

By Sir Alexander Fleck (Chairman of I.C.I.)

Sir Alexander Fleck, Chairman of I.C.I., recently gave a talk to the Royal Institute of Public Administration on the subject of "Vitality in Administration—the Pressure of Technical Change." In the course of his speech Sir Alexander referred to post-war technical changes in I.C.I.

I WOULD like to give some examples (Sir Alexander said) of technical change inside I.C.I. brought about by the pressure of technical events in outside circumstances and which were met in time by having a live administration.

First of all, let me take ammonia. In this country the basic raw material was coal or its derivatives. Coal was so plentiful in the mid-1930s that we were exerting ourselves to find additional uses for it, such as its hydrogenation to produce petrol; and we did so effectively to the tune of £3½m. capital equipment. The war rendered that plant obsolete so far as its original purpose was concerned, and now the coal position is such that new plant for ammonia now being erected is based on imported oil by a radically different process.

". . . pressure of technical events"

My second example is titanium. Pressure for a lighter metal possessing good properties retained at elevated temperatures to meet the technicalities of jet aero engines brought into being an industrial technique working on a very old chemical reaction—metallic sodium on titanium tetrachloride to give metallic titanium—an example of a well-known reaction requiring many new techniques to bring it effectively into a large-scale working method.

A third example is the production of synthetic phenol, perhaps to this audience more widely known as carbolic acid. Extraction from products of coal carbonisation used to be the sole source. Pressure of events, particularly the expansion of the plastics industry, impelled various people to find synthetic routes to the same end but via chemical reactions, and these have solved the technical problem of adequate phenol supplies.

By examples such as these the chemical industry of this country has built up an enviable reputation for progressive change to meet the technical needs of the times. I have said that there has been a rise in the output of manufacturing industry as a whole since 1907 of 2½% and since 1948 of 5% a year. The corresponding figures for the chemical industry in the United Kingdom are encouraging:

1907–1954. Average annual rate of expansion: 4·2%
1948–1954. Average annual rate of expansion: 8·8%

I consider that these figures give us good reason to believe that we in the chemical industry have evolved, not only vitality in administration, but an organisation which is alive to look after change of a greater degree than might be expected to occur. Can this go on indefinitely in the chemical industry? If it can, is it wise that it should? These are questions that are outside my range this afternoon, but I would say this: that if we are wishful, as I am sure we are, to maintain our place among the leaders of the chemical industries of the world, for many years yet the pace must be maintained.

Not all industrial organisations will require to develop at the same rate; sometimes it will be high, of the order of 6%, sometimes much lower than that. But whatever the rate, by such methods as those that I have outlined I believe that, no matter what the technical climate may be, an industrial organisation can maintain itself in vitality doing justice to the principles of its existence.

Vitality means change in some degree—to be static is but one step away from being moribund. One price of vitality is constant vigilance, and constant vigilance means that informed study of change must range over the whole organisation.

NEW HOPE FOR LEPERS

By D. P. Allen (Pharmaceuticals Division)

Scientific research, in which I.C.I. has played a considerable part, today places in the hands of leprologists an effective means of controlling this centuries-old scourge. With modern treatment the patient is able to lead a relatively normal life and is being freed from the ancient prejudices against him.

FOR more than 3000 years leprosy has been a tragic affliction of mankind, with segregation the only means of control. Its history is strewn with the wrecks of many remedies, nearly all of which in their time have revived hopes, only to dash them again soon afterwards.

Modern research into the use of a certain group of drugs known as the sulphones has been responsible for a very great advance in the control of leprosy. Complex derivatives of the parent sulphone, diaminodiphenylsulphone, were introduced during the first half of this century by American leprologists. The cost of producing these complex substances prevented their use on a large scale, especially in the more backward areas where the incidence of leprosy is particularly heavy. For the long-term treatment necessary, cost of treatment is very important.


The Queen visiting a leper settlement during her Nigerian tour

British workers during the last decade, however, showed that the parent sulphone, which is commonly referred to as DDS for the sake of brevity, could be used just as effectively and with safety in the treatment of this disease. The low cost of this simpler form of the drug enabled trials to be undertaken on the widest possible scale.

The response obtained by these trials has been most convincing. The drug can be given by the mouth in tablet form, and only the minimum of medical supervision is necessary once treatment is established. Although the drug must be given over a long period of time to produce an apparently complete cure, the initial response to treatment is extremely rapid, and dramatic improvements can be seen in even the most neglected cases. The patients soon lose the horrifying characteristic skin lesions which are so obvious in the neglected cases. Appearance returns to almost normal within a year of treatment.

I.C.I. scientists have been foremost in making this new remedy freely available to leprologists, and today the Company's 'Avlosulfon' is used in many leprosaria throughout the world. More recently their research has been responsible for developing a new soluble form of 'Avlosulfon' for injection. This new derivative is expected to fulfil a most useful role in treating patients who are unable to take DDS by the mouth and in cases where it is better to give the drug by injection, such as uncooperative and illiterate patients who cannot be relied on to take the tablets regularly without supervision.

The latest research into leprosy treatment is being directed to cutting down the period necessary to effect a final cure. Although initial response is rapid with DDS, it is very difficult to establish finally that a complete cure has been brought about. Fortunately, however, relapses are infrequent, and where they do occur they can be easily reversed by continuing treatment.

Leprosy is no longer a disease of outcasts, but rather a curable infection with a relatively low infectivity and against which effective protection is possible. Leprosaria have become places where patients go for treatment and where they can lead relatively normal lives. With the advances now being made it is possible to foresee a steady reduction and even eradication of the disease.

It is almost impossible to form even an approximate estimate of the number of sufferers from leprosy now in the world. The best guess is that there are at least 2–4 millions of persons affected with the disease. In British-administered territories alone the authorities say that there are 750,000 cases among 68 million people. The disease is especially common in Asiatic countries, but the heaviest incidence occurs in Central Africa.

OIL PROSPECTING WITH EXPLOSIVES

By Gordon A. Teichmann (Nobel Division)

Explosives are today an essential tool of the oil prospector. From the size and type of vibration made the prospector can judge the structure of the ground below his feet, and so locate the huge domes of porous rock in which oil can collect.

One wonders if I.C.I. ever advertises for explorers, because there is no doubt that areas are now being prospected for oil where the foot of man has never previously trod—and there from time to time you will meet Technical Service Engineers of Nobel Division visiting seismic prospecting crews and advising them on the use of explosives.

Oil is found over a very wide area of the earth's surface —in fact there is a small quantity in England near Nottingham—but through some quirk of fate the most economically workable areas are also in the most unpleasant spots. It seems that the choice of the world's future oil supplies lies in the hot deserts of the Middle East, the humid mangrove swamps of Central America, or the hot and humid tropical rain forests of Africa and the Far East.

Oil accumulates under the earth's surface at depths averaging from 1 to 2 miles in areas where there are open-grained sedimentary deposits, such as limestone and sandstone. Unfortunately, as oil is lighter than water, it will tend to dissipate in time unless trapped by some impervious layer such as clay.

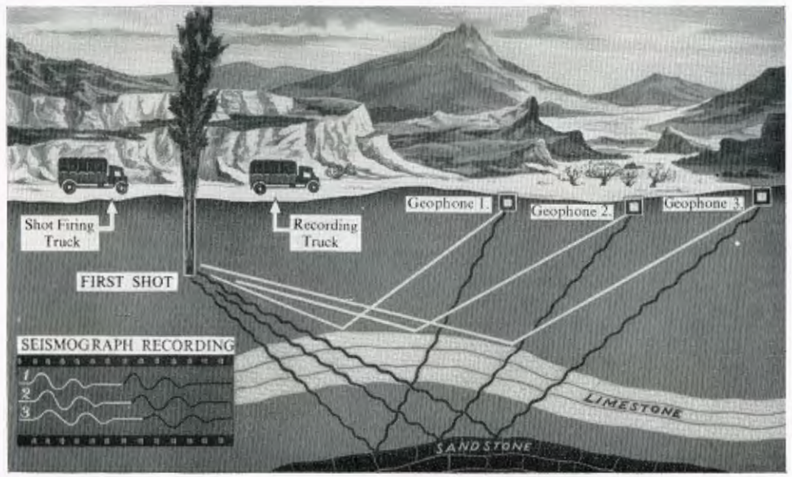
Before it is economic to pump the oil out of the ground it is necessary to find it in large underground reservoirs. This will occur most commonly where there has been a major geological upheaval distorting the rock structure so that it forms huge domes, or anticlines, of porous rock in which the oil can collect. It is the task of the oil or geophysical prospector to find these oil reservoirs. He does this by creating small earthquakes and recording them on a seismograph.

Everyone has experienced vibration effects from time to time. For example, a door slamming down a corridor can be recognised as such because it causes a typical noise which is registered in the form of air blast to the ear drums. Again, the vibration given to a building by a bus is different from that given by a car or a heavy lorry and can be detected as such.

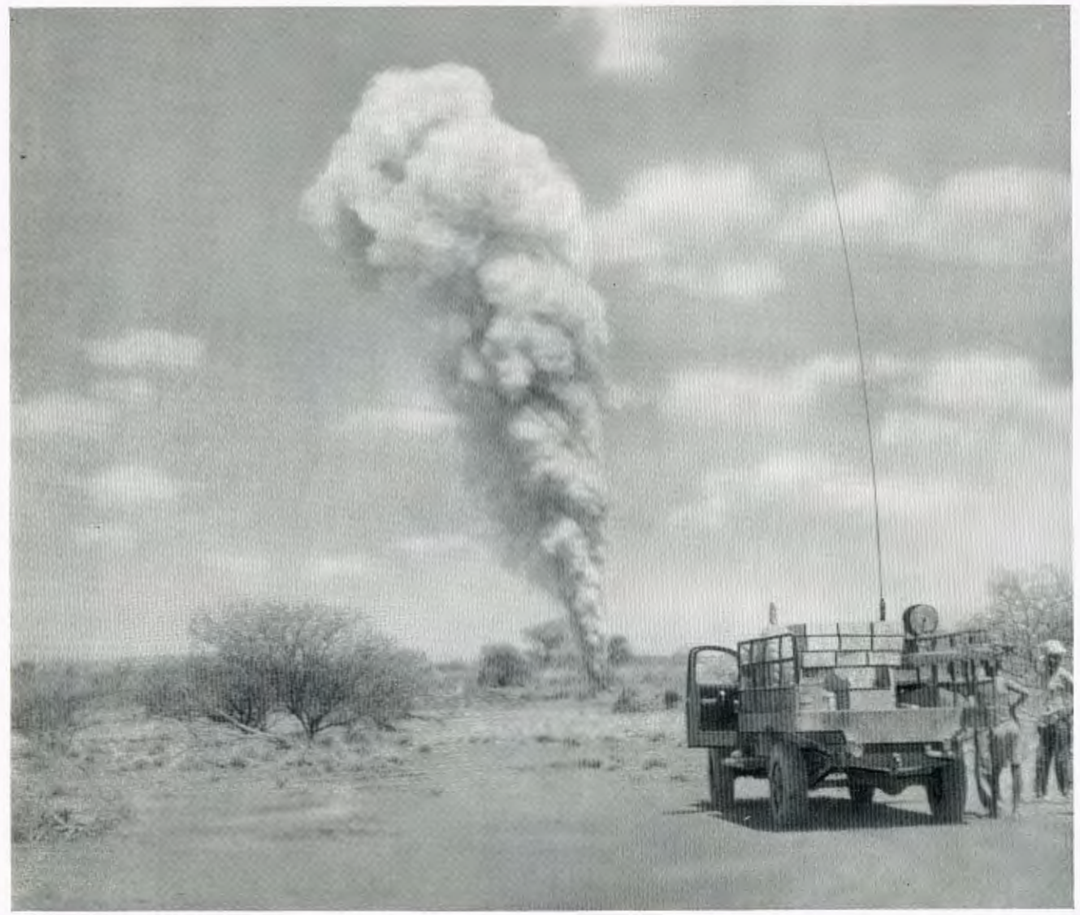
Though it is probably not realised by the individual, the registering of these noises and their connection with particular things is associated with the magnitude and type of vibration which reaches the ear drum.

The geophysical prospector uses this principle to locate oil areas. He replaces the noise of the bus or car by an artificial earthquake and the ear drum by sensitive instruments called geophones. The geophones in turn record the movement on a photographic drum mounted in a seismograph recording truck.

From the size and type of vibration made the prospector can judge the structure of the ground below his feet, because these shock waves travel rapidly in hard, compact rocks and more slowly in softer rocks. Furthermore, some of the waves are reflected off the layers of rock,



GEOPHYSICAL PROSPECTING. *An explosive charge is detonated which sends shock waves into the ground. These waves are reflected off rock layers and recorded by geophones. The time interval and type of vibration indicate the depth and character of the rock.*



PROSPECTING IN AFRICA. *A 350 lb. seismic shot is detonated.*

and the depths at which these layers lie can be calculated.

Advising on these man-made earthquakes is the province of the I.C.I. engineer. The method is to drill a hole in the ground to a depth of up to 300 ft. and put in an explosive charge of between 1 lb. and 1 ton. Mainly two types of explosive are supplied for this work. The most important is 'Geophex,' which is a special nitroglycerine composition and probably the most versatile of all explosives made today. It is sold in 2½ lb. and 5 lb. cartridges made up in special containers which can be screwed together so that a long column of explosive can be lowered at one time down a drill-hole.

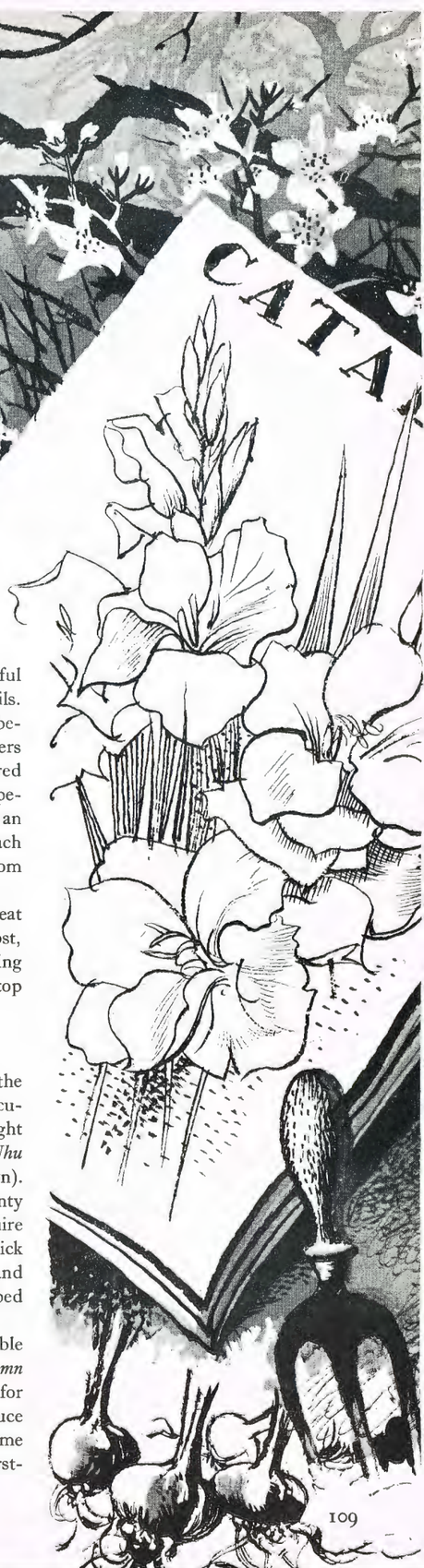
This explosive has been designed for use under very difficult and arduous conditions, many miles from civilisation and modern conveniences. Engineers have reached their destinations by unusual ways—in Borneo by helicopter; in Africa by small planes and walking; in the Middle East by Land Rover or lorry with special sand tyres; in British Honduras behind a bulldozer making a track through the jungle but still leaving the trees touching overhead; and even riding on a donkey or a camel. Then, too, there are other more intimate hazards—snakes, mosquitoes, leeches, ticks, and sometimes crocodiles.

The prospector works with a compact self-contained group of men, usually 10–12 Europeans and 40–50 natives. About one-third of the staff is occupied in drilling and designing the small earthquakes, another third record and interpret the effect when the explosive is detonated; the others are employed in mapping the district and looking after the physical needs and field requirements of the seismic crew. A tough life, you may say; but I can assure you it is not a dull one.

Garden Notes

By Philip Harvey

Decoration by Edith Hilder



THE experts seem very fond of advising the amateur to mow his lawn in winter during mild spells, especially if the grass is inclined to straggle. I am sure none of these gentlemen possess a lawn on really heavy soil like mine, which is impossible to tread in winter unless Wellingtons are worn!

On lighter land to mow or not to mow is still an open question. When I started to take an interest in gardening my parents lived in Cambridge, which is, of course, in one of the driest areas in England. The light, sandy soil was exceptionally fertile, and so easy to work that even after heavy rain you could almost lie down and go to sleep on it with no ill effects! But we still never risked cutting the lawn in winter, and it was well into March before the first mowing was given.

In spring and summer, when the top soil is less retentive of moisture, mowing can be undertaken when the grass is slightly moist, but I am convinced that winter cutting is usually best avoided. Mowing really wet grass can be a very tedious job, apart from the consequent harm to both lawn and machine. The fine grasses tend to be torn at the roots or are flattened and not severed properly. One is compelled to stop more often to clean the mower.

It is usually early April before the first mowing is given on this heavy ground, but on lighter, more open soils you may well have started two or three weeks earlier. You should, if possible, avoid mowing during cold east winds, which are always liable to scorch the grasses. (Incidentally, these cold winds often do more damage to rose trees than the sharpest winter frosts.)

The first two or three mowings must be very light, in other words the grass should only be "topped," as the groundsmen say. Remember that regular light mowings remove less plant food from the soil and are, of course, less laborious than occasional heavy cuts.

Weeds are the next problem, although they should present no real difficulties if you tackle the job of eradication intelligently. The right kind of weather is important, and any failures with selective weedkillers can usually be traced to applications under unsuitable conditions.

Best results are invariably secured when the weeds are really forging ahead. Warm, settled weather when the temperature ranges between 60° and 70° F. is ideal. If the thermometer falls below 50° F. you will not obtain a good "kill."

During a drought, weeds on light land especially become leathery and unable to absorb the weedkiller, so avoid applications at this time.

Should one apply 'Verdone' over the whole of the lawn or only on those portions where weeds are obviously present? One is often asked this question, although the answer is surely a matter of common sense. The aim is, of course, not merely to destroy the weeds which are actually visible but to kill the seedling weeds already in the soil and any that may be blown over from neighbouring gardens or deposited by birds.

To sum up: apply your 'Verdone' any time from now on except during periods of drought, and do not forget to use a complete inorganic fertilizer about ten days before each application, to give the grass a fillip once the weeds have been killed.

Early May is probably the latest time for planting gladioli, but it is really best to finish all plantings by the end of April, otherwise you may not obtain any blooms until September. By planting at ten to fourteen day intervals a succession of bloom is possible, and many gardeners favour setting the corms among antirrhinums, pentstemons and other summer bedding subjects.

Hard things are sometimes said about seedsmen, amateurs often complaining that the flower in their garden cannot compare with the same flower on the seed packet. To be fair, I think the fault frequently lies with the beginner, who forgets that plants must be reasonably well treated as regards soil, feeding, etc., if first-class results are to be expected. But I was a little staggered the other day to read in the catalogue of a world-famous seedsman and gladiolus specialist that modern gladioli are "as easily grown as mustard and cress"!

The truth is that gladioli demand careful soil preparation, as they dislike very dry soils. Perhaps the best way to grow them is between rows of vegetables to furnish flowers for cutting. If you favour the large-flowered varieties which generally need staking, especially in exposed, windy positions, it is an easy matter to insert a strong post at each end of a row, stretching garden twine from end to end, and tying the plants loosely.

Working in generous quantities of peat will help to conserve moisture, while compost, hop manure and similar humus-forming materials should be well mixed with the top spit of soil.

Varieties of gladioli are legion, but the following large-flowered kinds are particularly fine: *Bit o' Heaven* (orange), *Ravel* (light violet-blue) and the multi-coloured *Uhu* (salmon, ash-grey and mahogany-brown). Among the smaller-flowered, more dainty Primulinus varieties which do not require staking I can recommend *Red Roofs* (brick scarlet), *Salmon Queen* (salmon-orange) and *Ivory and Mauve*, which is well described by the name.

April is another good month for vegetable sowings. For example, *Veitch's Autumn Giant* cauliflower sown now will be ready for cutting in October. Peas, carrots and lettuce are equally suitable. Remember to use some "Seed-Saver" before sowing to ensure first-class germination.

Fag Card, Mister?

By G. T. Perkins (Head Office)

Cigarette card collecting is big business nowadays. Books have been written about cartophily. Eminent people have done research. Big money is paid for early sets. Here a collector who owns over 100,000 cards describes the hobby.

WHEN one mentions collecting cigarette cards one's thoughts generally go back to the 1930s, when all over the country anyone seen smoking or leaving a tobacconist's was likely to be greeted by a small boy's "Got any fag cards, mister?" It is a far cry from those days, and cartophily is an internationally recognised hobby now.

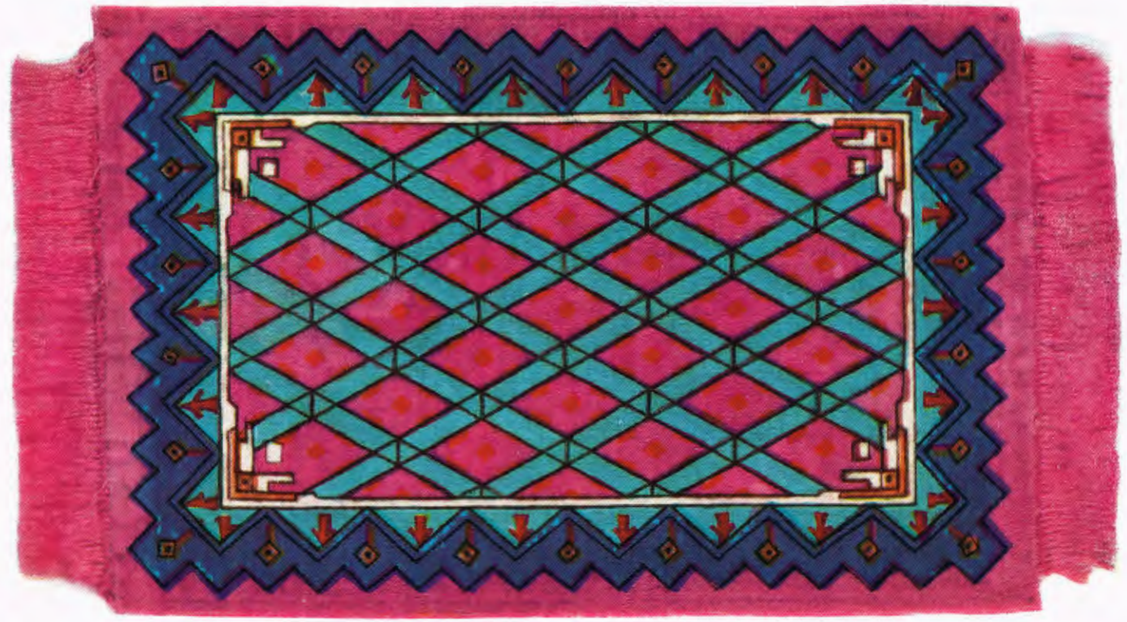
Broadly speaking, cartophily covers the collecting of any "collectable items" which are given away with any commodity, either packed with it or handed to the purchaser. However, even the acknowledged experts are unable to agree on an exact definition of a cartophilic item. My own collection is restricted to items issued by the tobacco trade. When one remembers the silk flags and numerous card games issued, to describe cartophily as collecting picture cards is to exclude some very worth-while items.

It is more than eighty years since the first "collectable items" were issued by the tobacco trade. Little is known about items of before the turn of the century, and there are few collectors who have any complete sets of those early series. Up to about 1902 cards were usually not numbered, nor were they identified with any particular manufacturer; but a great deal of research by Col. Bagnall, D.S.O., M.C., has enabled collectors to catalogue most of these early issues.

One question frequently asked is "Why were cigarette cards ever issued?" The answer, so far as I know, is that the early cigarette packets were in effect just paper wrappers and the manufacturers found it necessary to insert a piece of cardboard at the back of the cigarettes to protect them during transit. The cardboard was plain at this stage; later the card carried the trade mark of the company concerned and finally there emerged the cigarette card proper. When the packets themselves were made of cardboard and there was no longer any need for a stiffener, the tobacco trade continued to issue series of cards, using them as a selling point.

PIN-UP CARDS, YESTERDAY AND TODAY
1920 1954

An immense range of subjects is covered by the thousands of series issued in almost every country in the world, including Russia, with a wealth of concise and accurate information. But shortage of paper and cardboard during the last war stopped the issue of cards almost everywhere, and the practice has not been generally resumed.



A MINIATURE SILK RUG, *one of a series issued in the United States in the early* 1900s *with the avowed object of tempting the ladies to smoke. The rug is reproduced actual size.*

Scarcity value puts most of the earlier series out of reach of any but the most ardent collector. Some sets command £50 or £60, but there are a considerable number issued between 1930 and 1940 which can still be obtained for as little as 1s. or 1s. 6d. per set. It is advisable for a beginner to concentrate on one type. In fact, most collectors specialise and restrict themselves in the main to a particular period, subject, manufacturer or country. Not to do so would mean having a very large collection and would make the task of cataloguing it almost impossible.

I started collecting when I was about 11, collecting any cards that came my way from my father, relatives and friends. When I became really interested in the hobby I made special arrangements with a local tobacconist. He placed an empty box on his counter and invited customers to leave their cigarette cards there. Thus I gathered a very large number of cards, covering practically every series then being issued in London.

By the time I was 16 or so it became obvious, owing to housing difficulties, that I would have to give up the hobby or specialise. I chose to specialise, and concentrated from then onwards on collecting "views," using my spare sets for swops or selling them in order to buy others.

There are various methods of housing the cards. My own system is to keep each set in an empty cigarette carton. It is not essential, but it is advisable, to compile some form of catalogue or reference book for your collection. Not only does this help you to keep a watch on the collection as a whole, but, more important, it enables you to refer to one particular card or set without having to go right through them and thus possibly spoil the cards with frequent handling. Incidentally, from about 1937 to 1940 several tobacco manufacturers issued cards with sticky backs, and one could in fact buy albums containing each set. Curiously enough, these album sets have little or no commercial value today.

As can be imagined, oddities arise from time to time such as misprints, wrong names, or incorrect information on the back of the cards; but unlike this sort of thing in philately, these mistakes have no special financial value.

PLAYER'S CIGARETTES

SEA BREAM

THE POLO PONY

MITCHELL'S CIGARETTES

MACLEAN (DUART)

PLAYER'S CIGARETTES

F. J. Perry

SERVICE

FOR MERIT

ORDER OF MERIT

WILLS'S CIGARETTES.

R'S CIGARETTES

DIEU ET MON DROIT

THE UNITED KINGDOM

SOAP

Henry

PLAYER'S CIGARETTES

THE LAW ASSOCIATION VOLUNTEERS, 1903

PLAYER'S CIGARETTES

WILLS'S CIGARETTES

ARMS OF COMPANIES

Ch. Clint Chief

BLACK CAT CIGARETTES

TAXI-CAB DRIVER

STOP-CARRYING OUT YOUR IN-TENTIONS AND WATCH FOR MY SIGNALS

THE JUMPING CARD

OGDEN'S CIGARETTES

PLAYER'S CIGARETTES

ADÉLIE PENGUIN AND CHICKS

CHURCHMAN'S CIGARETTES

THE LUTINE BELL AT LLOYD'S

Politics

WILLS'S CIGARETTES

THE "NORMANDIE"

WILLS'S CIGARETTES

THE TORTOISE.

CHURCHMAN'S CIGARETTES

VIAUR VIADUCT, FRANCE

WILLS'S CIGARETTES

A CHRONIC COMPLAINT.

Aide-de-Camp. "'The English force, so please you.'"
Kaiser. "'Take thy face hence . . . I am sick at heart.'"
(MACBETH, Act V., Sc. 3.)

By special permission of the Proprietors of "Punch."

PLAYER'S CIGARETTES

AUSTIN SEVEN RUBY SALOON

WILLS'S CIGARETTES

"CORONATION SCOT"

PLAYER'S CIGARETTES

THE BISHOP OF CANTERBURY

WILLS'S CIGARETTES.

THE BEZANT

Cigarettes

The Supernatural

New Town

By J. B. D. Pagden (Plant Protection Ltd.)

The new town, brain-child of bureaucracy, planned for light and air, grouped for rivalry in sport and culture—how will it fare?

THE Clerk of Works on Contract T21B gave me an old-fashioned look. "June 13th?" he thundered. "Who told you?"

"Er—well," I said, "the local paper said so." I felt like Al Read talking to his professional pessimist.

"Much they know!" snorted the Clerk of Works. "With all that snow, etcetra, I mean-ter-say, is it reasonable? Look at it!" he went on bitterly, gesticulating vulgarly towards a sorry pile of planks, buckets, old tiles, drainpipes and miscellaneous bric-à-brac. "Does it look like June 13th?"

It certainly did not. Nor, for that matter, did Contracts T21A, C or D or any of the other development sites look in the least likely to be completed in time to benefit this generation. Yet the strange thing about a New Town is the speed with which order is conjured out of chaos. A dismal heap of chipped bricks, standing in a dirty puddle, is transformed into an arcade or an assembly hall in no time at all.

My New Town is a relatively modest affair with a target population of 65,000, but the planning for light and air is such that it will, when completed, cover an acreage as big as that of Leicester. Consequently most people see regularly hardly more than a tenth of the development work and are therefore surprised or infuriated when a steel scaffolding blots out their favourite view overnight.

It is obvious, even at this comparatively early stage of its growth, that the New Town is going to have some interesting social problems. Most people, for example, do not realise that a New Town is not just something tacked on to an existing community: it is a completely remodelled township. A suitable town is chosen and is developed over a period of up to twenty years into a New Town. The original inhabitants are usually quite ignorant of the meaning and purpose of a New Town, yet they have less excuse for ignorance than outsiders. Plans, specifications and detailed descriptions were open for public inspection, and objections were considered in ponderous detail long before the work began. Yet many tradespeople now profess annoyance and even anger at the scheme's progress.

A publican of my acquaintance expressed himself with feeling on the subject. "It's all very well up there," he said, waving in the direction of the first "neighbourhood" (now almost complete) on top of the hill; "but why bring it down here?"

This is a prevalent attitude. "Up there" they can do what they like; but let them leave respectable citizens in peace. "Up there," you are led to believe, "they" are in some way faintly disreputable, and my publican friend and others of the same persuasion were delighted when the first "neighbourhood" turned out to have its own pub, church and dance hall. In fact every "neighbourhood," of which there will eventually be five, will have its own individual social amenities, but the town centre is being reconstructed to constitute a communal social and municipal centre for the town.

The grouping of semi-independent townships within a town is a novel idea. The intention is to foster rivalry in sport and culture and to develop a strong community feeling. It is too early to gauge the

OLD TOWN *shopping centre—random, spasmodic, unique, built to meet needs as they arose*

NEW TOWN *shopping centre—spacious and functional, planned to meet needs before they exist*

possibility of success, but at least the organisation and planning have left nothing to chance. Moreover, the greatest care is taken to see that the New Town does not degenerate into an isolated dormitory suburb.

This is a very real danger in my New Town, which is less than twenty-five miles from Charing Cross. The Development Corporation has introduced light industry, but most of it is producing consumer goods vulnerable in times of trade depression. In addition, efforts are being made to entice large public companies to take office accommodation in the town; if this attempt fails—and there is yet little sign of its succeeding—there will be no alternative but to fill many of the new houses with people who have no connection with the business life of the town.

I cannot count myself a New Town immigrant, although I am a recent arrival, because I am what the Americans call a commuter and I live in the "old town." My personal opinions of this social experiment are therefore of no interest; but those of the true colonists, most of them Londoners, are illuminating.

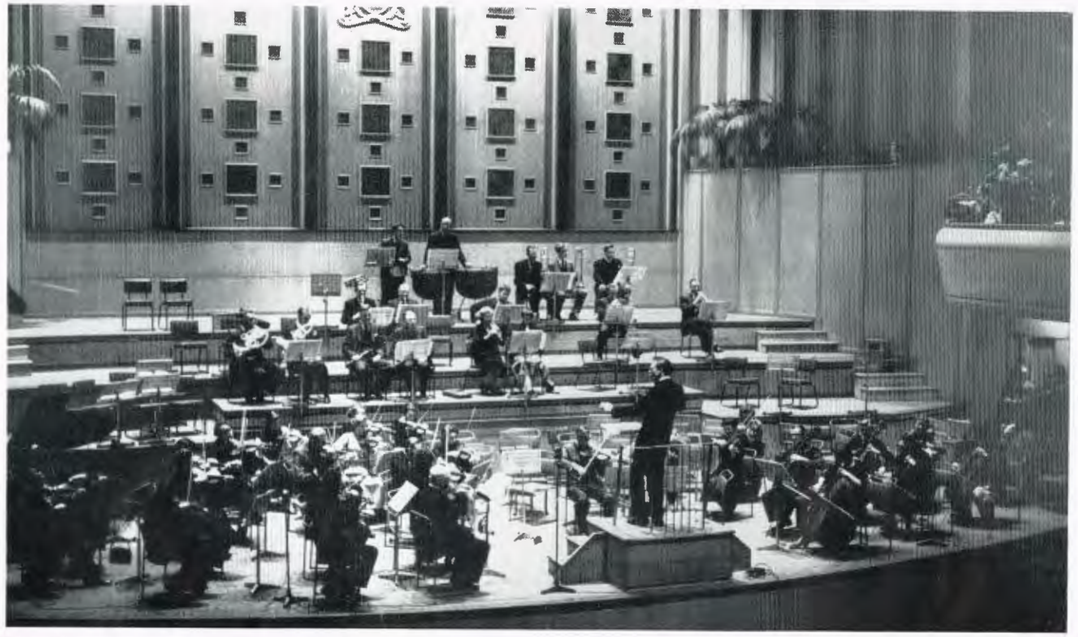
They seem to be fairly evenly divided between the enthusiast and the rabid opponents; there are no "don't knows." Until last year I was a Londoner myself, and I can understand the sentiments of the bus conductor who told me that he "couldn't somehow settle down." To the Londoner there is something phoney about the glistening new shops, the very modern concrete lamp-standards and the brash enthusiasm of the well-meaning busybodies who try to organise everybody out of existence. The women are more outspoken than the men and will tell you without hesitation that they wish they had never left Stoke Newington. They are also strongly critical of the manners, dress and way of life of the original inhabitants. The criticism is mutual.

The enthusiasts, on the other hand, beam proudly at you and refuse to hear a word against the place. Their faith is really quite touching, and they throw themselves wholeheartedly and unquestioningly into local affairs. Many of them give the impression of trying to convince themselves rather than others.

You can usually detect them in the street, for they stride along taking great gulps of fresh air as if they were afraid it might be used up before they had their daily quota. They almost hang labels on their children to prove to the world how much more healthy little Johnny has been since he lived in the country.

It is interesting to speculate whether the completed New Town will acquire a distinctive character of its own, as its designers intended, or whether it will finish as a hotch-potch of widely differing types of community with little relation to one another. In my opinion the planners have made an admirable plan, but, in the case of my New Town at least, they have chosen the wrong place.

NEWS IN PICTURES



Blackley Orchestra, *under their conductor David Jordan, playing music by Bizet, Waldteufel and Winkler at the Free Trade Hall, Manchester. The concert, under the patronage of the Lord Mayor, was in aid of the National Spastics Society*

Newest *and most up-to-date I.C.I. Medical Centre is at Castner-Kellner Works, Runcorn. It is designed to provide both a full accident service and a comprehensive medicine and welfare service for all members of I.C.I. in the Runcorn area*

"Merryweather," *Alkali Division's veteran fire engine, has been sent to the scrap merchant's after 44 years' service at Winnington. Fireman J. Gannon gives a last polish to the brasswork*

Comedian *Norman Wisdom visited the 'Terylene' stand at the Men's Trade Fair held at Royal Albert Hall. He is seen above trying on permanently pleated 'Terylene' and wool dress kilt. Below: The new South Coast "One Design" class yacht, the first ever to have 'Terylene' sails specified*

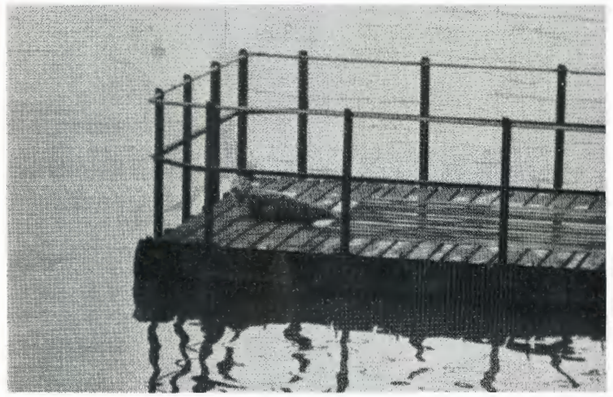
First holder *of the Alkali Division Youth Cup is 17-year-old apprentice fitter Geoffrey Buchan photographed (above, right) with Mr. G. Shaw, a senior fitter. The trophy, presented by Mr. W. M. Inman before he retired as Division chairman, is to be awarded annually to the apprentice doing the best year's work*

Sikorsky helicopter *disassembled into four units and wrapped in 'Visqueen' polythene film ready for its 8000-mile sea trip to the Antarctic, where it is being used by the British Grahamland Survey of 1955–56. The 'Visqueen' film (about 2000 sq. ft. was used) prevented corrosion during the journey*

The Lord Mayor *and Lady Mayoress of Manchester see demonstration of dyeing tubular fabric during visit to Hexagon House. With them are Mr. G. O. Mitchell, Mr. H. Jackson (Joint Managing Director), Dr. J. Avery (Division chairman), Mr. R. W. Speke and Mr. Dutton. Below: They see a display of dyed fabric in the Viscose Section*

In dry dock *at Irvine, the Nobel Division's "Lady Anstruther" undergoes her annual survey. While in dry dock she was equipped with the Subsig echo sounder, one of the latest aids to navigation*

New heat-resistant plastic, *'Alkathene' HD, for cables makes possible thinner insulation, tougher sheath and higher service temperatures. Above, right: Bottles made in 'Alkathene' HD. Story on page 123*



Rare Visitors. *Above: Fox caught at Metals Division Kynoch Works during arctic spell last February. Left: A grey seal takes a rest on one of Paints Division's testing rafts for anti-fouling paints at Brixham Marine Research Station. (Photograph by courtesy of the "Torquay Herald and Express.")*

Hockey. *Miss J. K. Dingwall, a laboratory assistant at Grangemouth Works, member of the Scottish women's hockey team which toured in Holland at Easter*

B.B.C. *programme "Today in the North" included interview on inland waterways with Captain A. G. Griffiths, Alkali Division Marine Superintendent*

Mr. C. D. Flanders, *Lime Division Sales and Transport manager, who retired in March after 34 years' service*

I.C.I. NEWS

MR. J. L. ARMSTRONG RETIRES

AFTER 29 years' service, on 29th February Mr. J. L. Armstrong retired from the Main Board of I.C.I.

After graduating in mathematics at Cambridge, Mr. Armstrong became articled to Sir William Peat of W. B. Peat & Co., chartered accountants at Middlesbrough in August 1914, but soon afterwards joined the Forces and held a commission in the Green Howards. He saw service in France and Belgium and was severely wounded in June 1917. On demobilisation he returned to the service of his old firm, but while working on the audit of Nobel Industries Ltd. he came to the notice of Sir William Coates in 1929, who invited him to join I.C.I.'s Treasurer's Department.

In 1935 he became Assistant Treasurer, and throughout the second world war he acted as Treasurer during the absence of Mr. P. C. Dickens on military service. In November 1945 he was appointed Treasurer, and in September 1952 he joined the Main Board and became Finance Director, which office he held until he retired. *Mr. S. P. Chambers, Deputy Chairman of I.C.I., writes:*

Len Armstrong was Treasurer when I joined the I.C.I. Board in 1947, and it was inevitable that coming from outside as Finance Director I should lean heavily on the Treasurer and his staff, particularly during those early years. I was very grateful indeed that the office of Treasurer was held by Len Armstrong, a man of outstanding competence and reliability. If I owe more to him than I do to my other colleagues it is because on every matter within the wide range of duties of the Treasurer's Department, however difficult and however technical, I could always rely on Len Armstrong not only for a thorough understanding of the subject but for the greatest clarity in exposition and for a firm recommendation. I can recollect no case in which he either had the facts wrong or was unable to make up his mind on the facts.

On becoming Finance Director he showed himself capable of exercising a broad and sound judgment on issues of all kinds. One of the duties of a finance director is to cut through some of the emotion and sentiment which surround problems that come to the board and to state the facts in a clear, if somewhat coldly logical manner, and this Len could always do—sometimes to the discomfort of some of his colleagues. A company such as ours needs all kinds of men, and among the most valuable are those like Len Armstrong who can restrain the impetuous and bring us back to the hard facts of life. He has been a pillar of strength, not only to his colleagues on the Main Board but to the chief accountants in the Divisions and those responsible for the Company's financial matters all over the world. At all times he enjoyed the greatest confidence of all sections of the Treasurer's Department.

Like other members of the I.C.I. Board, Len is a farmer, and he will now have more time to devote to what was once a hobby and will now become, I suspect, a pretty full time job. Len goes into retirement with the good wishes not only of all his colleagues on the Board but of thousands of others throughout the Company whom he has helped and guided for so many years.

Mr. J. L. Armstrong

Mr. P. T. Menzies

MR. ARMSTRONG IS SUCCEEDED AS I.C.I FINANCE DIRECTOR BY MR. P. T. MENZIES

Mr. Menzies, who is 43, was educated in Midlothian at Musselburgh Grammar School, after which he studied at Edinburgh University, where he gained his M.A., with First Class Honours in Mathematics and Natural Philosophy. He joined the Company in 1939 as an assistant in the Taxation Section of the Treasurer's Department (having previously been one of H.M. Inspectors of Taxes). In 1947 he was appointed an Assistant Treasurer and in 1952 a Deputy Treasurer. In the latter year he took his place as a visiting director on the board of General Chemicals Division. He is also on the boards of Imperial Chemicals Insurance Ltd., Arnold Hoffman & Co. Inc., Imperial Chemical Industries of Canada Ltd. and Solvic S.A., Belgium.

Mr. Menzies is married, his wife being also a graduate of Edinburgh University, and lives in Hertfordshire. He has two children, a son of 16 and a daughter of 11.

TITANIUM: AN IMPORTANT STEP FORWARD

Early in February I.C.I. announced a big reduction in the selling price of its raw titanium. At 21s. a pound—under $3—I.C.I. titanium is now the cheapest in the world, the U.S. price at present standing at $3.45 a pound.

This news is important for two reasons. First, it represents a triumphant justification of I.C.I.'s faith in the sodium reduction method of extraction. When the Company entered the titanium field in 1949, virtually all the raw metal then available was produced in America by the Kroll (magnesium reduction) process. Early experiments with the sodium process had had only limited success, and some experts had expressed doubts about the quality of metal produced in this way. General Chemicals Division quickly proved not only that the sodium process could safely and successfully be adapted to commercial-scale production, but also that sodium-reduced granular titanium was at least equal in quality to Kroll sponge and, moreover, lent itself more readily to alloying and to conversion into massive form. Now they have proved the contention that the sodium process can also be made to yield a cheaper product.

Secondly, the price reduction marks an important step forward in the progress of the British titanium industry as a whole. Britain is already second only to the U.S.A. in the extent of its raw titanium industry, current output of 1500 tons a year comparing with a peak American output of 7500 tons in 1955. Within a year or two this country is expected to require an even greater output of raw metal for melting and subsequent manufacture into wrought or fabricated products, a high proportion of which go to the aircraft industry.

It is, however, clear that continued progress will depend on a broadening of the range of end uses to which wrought titanium can be applied. The metal's high strength/weight ratio and exceptional corrosion resistance indicate certain obvious lines of development, and I.C.I. is encouraging manufacturers to explore these. But many potential outlets will inevitably be blocked until the price of titanium approaches more nearly that of competitive materials. For this reason alone the recent reduction in the price of granular titanium—an essential first step towards bringing down the price of wrought products—is of the utmost significance.

THE THINGS THEY SAY

In recent weeks a new series of advertisements which is light in treatment and colloquial in style has appeared in the daily and Sunday press.

The series deals boldly with such subjects as decentralisation and how, by pursuing this policy, I.C.I. has contrived to reap the benefits of smallness and bigness; I.C.I.'s price policy; the ownership of the Company; the target of safety which is so energetically pursued in all our works; and with the Profit Sharing and Suggestion Schemes. Interspersed between these are advertisements describing the impact of some of I.C.I.'s newer products —such as new drugs, plastics and fibres—upon the life of the community.

All these advertisements appear under the generic title of "The Things They Say!", and, as this implies, each is a conversation piece between two individuals, developing at times into hot argument if the subject is controversial. The sketches are by the talented artist Peter Sachs. His work in another medium is already well known to many through the I.C.I. colour film *Enterprise*, which has been very much in demand both at home and overseas.

NEW I.C.I. DIVISION

At the beginning of the month a new Fibres Division came into existence. It takes over responsibility for the manufacture and business of 'Terylene' from the 'Terylene' Council, which has been dissolved, and of 'Ardil' from Nobel Division. The Division is also responsible for all the Company's research and development work on all other synthetic fibres, excluding nylon.

The Fibres Division Board is the same as that of the former 'Terylene' Council, and Division headquarters are at Harrogate. The Division is responsible to Mr. P. C. Allen, I.C.I. Fibres Director.

HEAD OFFICE

Retirement of Mr. H. Hirst

Mr. Herman Hirst, Buying Manager of the Chemical Section of Central Purchasing Department, retired on

Bottle of 'Alkathene' HD (left) is unaffected by boiling; this contrasts with bottle of conventional 'Alkathene' 20, which has completely collapsed

density, flexible 'Alkathene' collapse after the same treatment.

The new plastic is made by a modification of the I.C.I. high-pressure process for flexible polythene. During 1956 about 200 tons will be produced, mainly for trial purposes, and the Division intends to establish commercial manufacture on a progressively increasing scale. Suggested uses for 'Alkathene' HD include mouldings, piping, and cable sheathing.

I.C.I.A.N.Z.

Australian Polythene Project

In February I.C.I.A.N.Z. announced their decision to manufacture polythene in Australia under licence from I.C.I. Capital expenditure on the new project will, it is estimated, be in the region of £2,250,000.

Work has already begun on the site at Botany, New South Wales, and I.C.I.A.N.Z. hope to have their new plant in production by the end of 1957. Supplies of I.C.I.A.N.Z. polythene, once large-scale manufacture gets under way, will be sufficient to cater for the entire home market. At present every single ton of polythene used in Australia has to be imported from overseas.

Polythene's one raw material—ethylene gas—is indigenous, being made from alcohol produced in Australia from sugar cane molasses. This is of considerable significance in a country like Australia, which has an adverse balance of trade.

WEST AFRICAN LIAISON OFFICE

Royal Tour Decorations

The products of three I.C.I. Divisions (Paints, Leathercloth and Plastics) figured in the decorative scheme carried out in Government House, Lagos, and in the Royal Train in connection with the visit of the Queen to Nigeria.

Government House was largely redecorated for the occasion, and in the colour schemes adopted for the royal apartments the paints used, with one exception, were all supplied by I.C.I.

Black 'Vynide,' presented by Leathercloth Division, was used to cover a table originally intended as a writing desk for the Duke of Edinburgh, but it was eventually moved into the Queen's boudoir to accommodate the official despatch boxes.

A number of I.C.I. products, notably paints and clear 'Perspex' sheet, were also used in the decoration of the Royal Train.

* * *

OUR NEXT ISSUE

In May a conference is being held under the auspices of the Royal Society and others to celebrate the discovery of the first synthetic dye, Mauveine, by W. H. Perkin a century ago. William Perkin made his discovery when he was only 18 and retired from business at the age of 36, having already amassed a fortune. An article about this remarkable scientist has been written for the *Magazine* by Mr. C. Paine, formerly chairman of Dyestuffs Division and now I.C.I.'s Development Director.

Our colour feature includes some reproductions of the famous Redouté watercolours of flowers. Redouté is chiefly famed for his beautiful paintings of roses, but he has also painted the wild gentian, campanula and lily—three flowers which grow in the Alps. These reproductions will illustrate an article by Miss Norah Lewis of Central Registry, who writes about the profusion of beautiful wild flowers which can be found on the slopes of the Austrian and Swiss Alps in the early summer.

Another article of interest is a description by Mr. Samuel Ellingworth of some of I.C.I.'s old steam locomotives. The days of these are numbered as steam gives way to diesel power. Even people who know little or nothing about steam locomotives admit that they have a character and personality all their own, and it is fitting that an acknowledged expert on railways should pay tribute to these faithful servants of the Company.

ESCAPE

By John Watney (Head Office)

BURBURY was the first friend I ever had. Our birthdays were within two days of each other, and we arrived together at boarding school at the age of eight years and four months. We shared the same dormitory, our beds standing side by side nearest the door, so that when, at seven-thirty in the morning, the bell tolled for cold baths we were the first to lead the rush down the long brown corridor to where Major Thorp, dressed in an Arab cowl, stood by the baths to see that there was no cheating and that everybody went under the icy water, not only rapidly but with a cheery smile and a happy joke on their lips.

The only way in which Burbury and I differed was in our respective positions on the school list. Because he was two days younger than I he was bottom of the school, while I was one from bottom. This small distinction between us affected our outlook. While I could at least feel superior to one person in the school, he could feel superior to no one.

It was when we were half-way through our second term and I had reached a compromise with my surroundings that he became moody and took to hiding for longer and longer periods in our burrow. Every boy in the school had a burrow or shared one with friends. They stood on the waste land by the golf course, and were in reality large gorse bushes whose insides had been hollowed out so that when you crept in by a secret entrance you were like a grub in a prickly cocoon, safe both from the marauding bullies and inquisitive masters.

Our burrow was a particularly comfortable one, the previous owner having lined the interior with twigs and rushes, so that it had the smooth appearance of the inside of a bird's nest. There was a small locker for keeping food in, two pieces of old mat to lie on, three leather cushions, an acorn pipe for smoking blotting paper tobacco, and a pair of rusty secateurs with which to trim the gorse bush in the spring.

One day, when we were lying in the burrow watching through a chink in the gorse the bullies scouring the waste land in search of juniors, Burbury said:

"I can't go on any longer. I'm going to run away."

Planning to escape from the prescribed confines of the school was as much an occupational disease of new boys as it is of prisoners of war. But the school code, under the tuition of Major Thorp and the seniors, had made this the final and most degrading of schoolboy crimes.

"You'll never succeed," I said.

"The difficulty," he said, "is to convince my pater and mater"—he had absorbed the school phraseology if not the school principles—"that I'm serious. I told them during the hols that I wanted to leave, but my pater merely gave me a talking to just like old Thorp. Now if I ran away for a week and nobody could find me, that would make them realise I was in earnest, wouldn't it?"

"You could never last that long."

"I could, with your help."

"How?"

"I would leave a note saying I was running away, then come in here. Everyone would be looking for me outside the grounds. No one would think of looking in our burrow, as no one knows about it except you and me."

"You would have to eat," I said.

"You could bring me food. We made a pact of friendship, remember?"

This decided me.

"All right," I said. "I'll do it. When do we start?"

"After lights-out tonight. I've written a note to Major Thorp, and I've already written to my parents telling them I'm running away."

"What do you want me to do?" I asked.

"Nothing," said Burbury, "except to bring me food."

It was not until the morning bell rang that I realised that he had in fact gone, for there in his bed was a pillow

stuffed down the bedclothes like a dummy. After chapel Major Thorp called me into his study. He was dressed as usual in his tweed Norfolk jacket, and he sat behind his desk looking very thoughtful. He asked me whether I knew what had happened to Burbury. I said that I knew nothing.

"If, at any time during the day," he said, "you remember some remark of his that may cast light on this affair, I count on you to let me know. The wretched, misguided boy may well have met with an accident. His very life may depend on your memory. You may go."

The search began at two-thirty. And just after three I was called to Major Thorp's room again. When I got to his study I was taken immediately to the drawing room. This was a large oval-shaped room smelling of polishing wax and lavender bags. Visiting parents were entertained to tea here. Boys were never normally allowed in the room.

There were a lady and gentleman there, and I knew even before Major Thorp introduced them that they were Burbury's parents. They were both tall, but then most people seemed tall to me at that age. She had a very white face and kept on clasping and unclasping her hands; he looked so very much like a larger, older edition of Burbury that his crisp brown moustache seemed incongruous.

Mrs. Burbury looked anxiously at me and said in a low voice:

"You are David's friend?"

"David?" I asked.

"Burbury," said Major Thorp.

We never used Christian names at school, and I had not realised until then that Burbury's Christian name was David.

"Yes, sir," I said to Major Thorp.

Mrs. Burbury looked appealingly at me.

"Then he must have hinted that he was going to run away, perhaps even told you where he might be heading for?"

I remained silent; then she knelt down, put her arms round me and said "Please try and remember."

With her white face and small hat, and the warm scent coming up from her body, she was so like my own mother that I almost told her everything there and then; but I remembered my pledge to Burbury, shook my head and said:

"No, I don't know where he's gone." And refused to say anything more.

I was grateful that the scrutiny had ended and that I was allowed to go. It was getting late, and I had a lot to do. Prep had already started and the school seemed deserted. I went up to the dormitory and pulled the blankets off Burbury's bed, then I went to his locker and found a round tin box which had a picture of the Changing of the Guard on it. There was half a plum cake and ginger biscuits inside. I wrapped the box in the blankets and thus loaded made my way to the grounds.

It had begun to rain again, a fine mist of a rain that slanted in across the rhododendron bushes, and the grey twilight of evening almost obscured the black pine trees in the grounds, but I found my way easily enough to the burrow and crawled cautiously in.

"Burbury?" I whispered.

I heard a movement and then a torch light came on and I saw Burbury crouched in the corner of the hiding place. He was looking dirty and dishevelled. His eyes were red and his voice had a kind of whisper in it that I had not heard before.

"What a long time you've been!" he said. "I had given up all hope."

"I couldn't get away before," I whispered, pushing the blankets over to him. "There's some cake in that tin."

"I wish you would bring me something hot to eat," he said. He sneezed violently.

"I can't," I said. "It's difficult enough as it is. Your parents are here," I added.

"Are they?" A tinge of warmth came into his voice.

"They seemed very worried," I continued. "They think I know where you are."

"You didn't tell them?" He turned the torch full on to my face.

"No," I replied, "I didn't tell them."

"You'd better not!" I was surprised at the truculence in his usually docile voice. "You'd be breaking your vow. You'd better go before they miss you," he added, then he emptied the tin and pushed it across to me. "You'd better take this," he said, "to put some more food in."

I crept out backwards and then hurried away towards the school. It was very dark now, and I slithered and slipped down the banks of heather and blackberries. As I came down one steep bank that led on to the drive the tin box leaped out of my hand, clattered on to the hard surface and then rolled away.

Immediately a torch sprang to life and a man's voice said "Who's that?" and I found myself in a circle of light. I had twisted my ankle coming down the bank, and it was very painful. I sat on the side of the drive rubbing my leg.

"Good Lord," said a man's voice, "it's David's friend!"

The light was right above me now, and in it I could see Mr. and Mrs. Burbury leaning down and looking at me.

Mrs. Burbury sat down and began massaging my leg. "You know where David is," she said, "don't you?"

"Yes," I replied cautiously, "I know where he is." I felt her hand tighten on my ankle and then relax as she said in a low voice:

"Is he all right?"

"He's got a cold," I said, "and he's wet through."

I saw the torch light leap.

"You'll take us to him immediately," said Mr. Burbury in a loud, rough voice.

"Please, Tom," Mrs. Burbury said, "give the boy a chance." Then she turned back to me. "Why are you hiding him from us?"

"I'm not," I said earnestly, "really I'm not. I promised him I wouldn't tell anyone, and I must keep my word."

"Yes," she said, "that's very important; but there's no harm in telling us why he has done this."

"After all, we are his parents," said Mr. Burbury.

"Tom, please!" said Mrs. Burbury again. I heard Mr. Burbury grumble but keep silent.

"I'm sure," she said to me, "that you would like your mother to know if you were in his place."

She suddenly seized me by the arms. "Oh, God," she said in a completely changed tone of voice, "can't you forget your code of honour, and tell me where he is?"

"Please try and remember"

"I would like to," I said; "I really would, but . . ." and then I had a sudden idea. "It wouldn't be my fault if somebody *saw* me going to the hiding place and came in after me . . .?"

"What is the boy talking about?" said Mr. Burbury testily.

But I could see by the sudden lighting of her face that Mrs. Burbury understood.

"Of course it wouldn't," she said.

"And he wouldn't think I was betraying him?"

"Of course not!" said Mrs. Burbury eagerly. "Do you think you can walk with your twisted ankle?"

"It's all right now," I said, and stood up to prove it. It hurt a little, but no more than an ordinary sprain. "I'll set off first," I said. "I'll make quite a lot of noise so that you will hear me."

When I came to the burrow I nodded to Mr. and Mrs. Burbury, then I lay down on my stomach and wriggled in.

Burbury switched the torch on and said in a nervous voice: "Who's there?"

"It's me," I replied.

The light of the torch came round to my face. "What do you want?"

I had forgotten in my agitation to think of any particular reason for coming back to the burrow, but I said rather nervously:

"I wondered whether you needed any more blankets. It's getting colder."

For answer Burbury only sneezed.

This was perhaps the signal for which Mrs. Burbury was waiting, for her voice came suddenly and urgently from the outside.

"Is that you, David?"

The torch quivered and Burbury crouched into the corner.

"You told my parents?" he said accusingly.

"No," I replied. "They must have followed me."

Again came Mrs. Burbury's voice.

"David, are you all right?"

"You'd better answer," I said.

"Go away!" said Burbury in a loud voice.

"We've come to take you home," said Mrs. Burbury.

"Home?" Burbury's voice broke, the torch was flung down and lay, still alight, on the bracken, and in a moment he was crawling past me towards the exit.

I heard him get to the open, heard his mother's cry "He's wet through!" and his father shout "Come on, we'll carry him to the car." Then I heard their footsteps crashing away through the undergrowth.

I stayed for a few minutes looking at the burrow. I would have to take the blankets back, but it was too dark and wet now. It would take me a long time, because I would have to be careful that no one saw. I felt I would miss Burbury and would have to get someone else to share my burrow. At least I had not given away its position. Burbury would never tell and his parents would never remember.

I picked up the torch that Burbury had left behind. That at least would come in useful. I switched it off, wriggled out of the burrow, and made my way back to school; but I still could not decide whether or not I had betrayed my friend.

Cornish Coastline

Photo by Miss A. Lightfoot (Fernhurst)